

ABSTRACT OF THE DISCLOSURE

A frequency synchronization apparatus for an orthogonal frequency division multiplexing (OFDM) communication system includes a radio frequency (RF) receiving module for receiving OFDM signal, an analog/digital (A/D) converter connected to the RF receiving module, the A/D converter converting the OFDM signal into a digital signal, a frequency synchronization module connected to the A/D converter, the frequency synchronization module synchronizing carrier frequency, a Fast Fourier Transformer (FFT) connected to the frequency synchronization module, the FFT performing fast Fourier transformation to symbols from the frequency synchronization module, a channel estimation module connected to the FFT, the channel estimation module estimating channel response, an equalizer connected to the FFT and the channel estimation module, the equalizer equalizing channel, a residual phase tracking module connected to the equalizer, the residual phase tracking module tracking residual phase, a demodulator connected to the residual phase tracking module, the demodulator demodulating, and a controller connected to the frequency synchronization module, the controller controlling the frequency synchronization module.